

The listing of the claims will replace all prior versions, and listings, of claims in the application:

**Listing of Claims:**

Claim 1. (Previously Amended): A coupon used for measuring corrosion rates of material exposed to a hostile environment comprising:

a substrate, said substrate being formed of a material that is chemically inert in a fireside environment and having a high thermal conductivity;

a first long and narrow thin film resistive element carried on said substrate and exposed to the hostile environment, and

a second long and narrow thin film resistive element carried by said substrate and shielded from the hostile environment, said first and second thin film resistive elements being positioned so that they are close enough to each other throughout their paths to experience substantially the same thermal environment, such that changes in the resistance of said first and second element as a function of temperature are identical even when said coupon is exposed to high, variable heat fluxes in said hostile environment.

Claim 2. (Original): A coupon as in claim 1 in which said thin metal elements are composed of a material which has substantially the same resistance before being subjected to a corrosive environment.

Claim 3. (Original): A coupon as in claims 1 or 2 in which the substrate is an insulator.

Claim 4. (Original): A coupon as in claim 1 in which the substrate is a ceramic.

Claim 5. (Original): A coupon as in claim 4 in which the ceramic is beryllium oxide.

Claims 6-8 (Withdrawn)

Claim 9. (Original): A coupon as in claim 2 in which said material forming the thin films is a metal or metal alloy.

Claim 10. (Original) A coupon as in claims 1 or 2 in which said first and second resistive elements are on opposite sides of the substrate and the substrate is thermally thin.

Claim 11. (Previously Amended): A system for measuring the corrosion rate of metals in a hostile environment comprising a coupon including:

a substrate, said substrate being formed of a material that is chemically inert in a fireside environment and having a high thermal conductivity;

a corrodible long and narrow thin film metal resistive element carried on said substrate for exposure to the hostile environment;

a second reference long and narrow thin film metal resistive element carried on said substrate shielded from the hostile environment, said first and second thin film elements positioned on said substrate close enough to each other throughout their paths to experience substantially the same thermal environment, such that changes in the resistance of said first and second element as a function of temperature are identical even when said coupon is exposed to high, variable heat fluxes in said hostile environment;

means for driving a current  $I$  through said first and second thin film metal elements;

means for measuring the voltage  $VC$  generated across said corrodible thin film metal elements and the voltage  $VR$  generated across said reference thin film element by the current flowing therethrough; and

means for processing said current and voltages to provide a measure of change in resistance of the corrodible thin film metal element.

Claim 12. (Original): A system as in claim 11 including means for continuously receiving resistance difference to indicate the progression of corrosion.

Claim 13. (Previously Amended): A system as in claim 11 in which said thin film metal elements are deposited so as to have essentially the same resistance before corrosion of the corrodible element.

Claim 14. (Previously Amended): A coupon for use in measuring the corrosion rate of metals exposed to a high-temperature hostile environment comprising:

a substrate, said substrate being formed of a material that is chemically inert in a fireside environment and having a high thermal conductivity;

a first thin long and narrow elongated strip of metal or metal alloy adapted to be exposed to the hostile environment carried by said substrate; and

a second thin long and narrow elongated strip of the same metal or metal alloy as the first carried by the substrate and shielded from the hostile environment but positioned close enough to said first element to experience substantially the same thermal environment as said first element, such that changes in the resistance of said first and second element as a function of temperature are identical even when said coupon is exposed to high, variable heat fluxes in said hostile environment.

Claim 15. (Original): A coupon as in claim 14 in which the substrate is thin and the first and second elongated strips are on opposite faces of the substrate whereby the second elongated strip is shielded from the hostile environment by the substrate.

Claim 16. (Original): A coupon as in claim 15 wherein the second elongated strip is further shielded by an oxide film on its exposed surface.

Claim 20. (Original): A coupon as in any of claims 14, 15, or 16 in which the substrate is a ceramic.

Claim 21. (Original): A coupon as in any of claims 14, 15, or 16, in which said substrate is a metal with an oxide insulating and protective film.

Claim 22. (Previously Added): A coupon as in claim 1, in which said thin film resistive elements provide a continuous high resistance path in which there is a substantial change in resistance as the electrode corrodes.